



# GNOMON

Newsletter of the Association for Astronomy Education

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## EDITORIAL COMMENT

The Association has always been aware of the long gap between the April and September issues of *Gnomon*.

We are now in the fortunate position of being able to publish a fourth issue each year, thanks to the increased revenue generated by new members' subscriptions, as well as an anonymous donation earmarked for AAE publications and to a generous grant from the RAS.

This issue is the fourth in the present volume. If the membership continues to grow at its present rate, further improvements in the format and size are envisaged.

The next issue will be in September and will be Vol. 9 No. 1. Dates of publication will be around the dates of the Equinoxes and Solstices, that is the 21st December, March, June and September. It should be fairly easy to memorize these dates. Copy deadlines will be **five weeks** prior to publication.

Please send in your contributions – those from primary school teachers especially welcome.

## Astrology!

Following the ASP newsletter dealing with this topic and published with *Gnomon*, several readers have sent in contributions. The letters from Karenza Burk and Fiona Vincent in this issue, show that we may be witnessing the beginnings of a world-wide "counter-attack" to debunk some of the absurd pronouncements coming from this quarter.

I was appalled to read in the Radio Times, organ of the BBC, details of a "New Radio Times Horoscopes Line". Just dial a certain number, said the article, plus the "last three digits according to your sign of the zodiac" (a table is provided) and "you can catch up with your own stars". The call charges are 38p per minute (peak rate), or 25p (off peak).

It is hard to believe that such a venture emanates from the same (ultimate) source as the makers of such excellent programmes as "Horizon" and "Chronicle".

Please continue to send in material on this subject.

Eric Zucker

## ASTRONOMY AND THE PRIMARY SCHOOL TEACHER

By Tony Oldfield

The introduction of a National Curriculum which places particular importance on Science is good news for those working in Science Centres and Planetaria who have a vested interest in promoting science education. It certainly provides greater opportunity for access to Science by schoolchildren and hence will hopefully improve Scientific literacy but what about the primary school teacher? Is it good news for them?

By now, most teachers are probably immune to the reaction caused by mentioning the words 'National Curriculum Science', since they should have been preparing for the implementation of key stage I in September 1989, for several months.

Many teachers, however, are concerned especially now that Earth Science and Astronomy, which (despite some efforts by an enthusiastic few), have seldom been taught in the past and are now required under the guise of 'Earth and Atmosphere (AT 9) and 'The Earth in Space' (AT 16).

As Pennington<sup>1</sup> indicated, the reason for the dearth of Astronomy education in Primary Schools in the past is unlikely to be due to lack of interest among schoolchildren, since children in general tend to be most enthusiastic participants when space topics are addressed in the classroom.

Given this observation then why has the Astronomy 'nettle' not been grasped previously, and what can the AAE, Science Centres and Planetarium do to help support primary school teachers.

An appreciation of the reasons for the prior failure to take astronomy on board in primary schools may help us to decide on an appropriate course of action.

Perhaps the most important factor that has contributed to lack of Astronomy is that most primary teachers do not possess the knowledge base and hence confidence to tackle this subject area. Few of the teachers have themselves studied any science beyond secondary school level<sup>2</sup>. Of those who have, most did biology – having opted out of chemistry and physics when choosing options in their third year of secondary school. As a result, most primary school teachers have a natural aversion to physical science<sup>3</sup>.

In addition to this, many teachers believe that even at the simplest level of explanation, complex and expensive equipment is needed to teach astronomy. Even if this is obtained, then astronomy can only be taught outside school hours and therefore places undue pressure on teacher time. We all know that many practical activities and demonstrations can be performed during normal school hours, and the lack of a telescope is no reason for the omission of astronomy as a primary school project.

Finally, Astronomy text books must take some of the blame. With only a few exceptions, these books have been encyclopaedic in presentation, have shown little imagination and offered few ideas for simple practical tasks which teachers and children can easily follow in the classroom.

Despite the poor uptake of astronomy in the past, from September the 'Earth in Space' must be taught by law and its success really does depend on substantial preparation and training of primary school teachers. Feedback from many teachers informs me that apart from a few short courses for science coordinators, to date very limited provision is being made by local education authorities (LEA) for the teachers 'at the sharp edge.'

The supply of LEA-run courses is lagging far behind the demand, and this situation is unlikely to change in the future.

Primary teachers need to be given support and helpful advice on how best to structure activities and project work for the 'Earth in Space' target. There exists a wealth of experience and expertise within the AAE and amongst education officers in Science Centres, Planetaria and other museums and teachers should be encouraged to take full advantage of this.

At Jodrell Bank, two meetings are held each term to offer ideas and advice to teachers. These usually begin at around 4.15 pm and last for two to three hours, during which time they are encouraged to air their views and exchange ideas and experiences on aspects of teaching science and Astronomy. They are also provided with examples of practical activities for the classroom, such as moon phases demonstrations<sup>4</sup>.

The most encouraging development relates to how we reach out to schools and offer in-service training in-school, using one of the allowed 'Baker Days'.

In these sessions apart from providing subject knowledge teachers can more importantly make models and equipment (sundials), role-play motions of planets around the sun etc. Apart from improving teacher confidence and therefore increasing the chances, the successful implementation of Astronomy in the curriculum, these in-school days (i) develop and maintain links between teachers and Science Centres, (ii) improve publicity and contact with AAE and (iii) can provide a valuable source of income for the Science Centre.

Perhaps the AAE should consider more seriously, a programme of activities for such Baker-Day training? Many other Science Centres have considered offering such services but at present only a few have been able to commit themselves. It is clear that the AAE, Science Centres and Planetaria have a role to play in this regard. Teachers and LEAS should be encouraged to explore the possibilities of in-service training provision by 'outside' agencies more thoroughly.

An empty niche is presently awaiting exploitation!

Tony Oldfield is Education Officer at Jodrell Bank Science Centre and Tree Park, Macclesfield, Cheshire, which is a Resource Centre of the AAE.

## REFERENCES

1. Pennington, P. J. (1986). *Teaching Astronomy in the Primary School*. GIREP conference proceedings: Cosmos – an educational challenge, Copenhagen (ESA SP-253).
2. Summers, M. and Palacio, D. (1989) *Catching up with Newton*. *Times Educational Supplement*, 21.4.89.
3. De Boo, M. (1989). *The Science background of Primary Teachers*. *School Science Review* 70, (252), p. 125-127.
4. Oldfield, A. C. (1989). *Earth, Space and School*. *Questions 1 (8)*, p. 13-15.



## The Association for Astronomy Education

Report on the Ninth Annual Meeting held in London on 13 May 1989.

We were fortunate to be able to hold this year's annual meeting at the Science Museum, London. On a bright May Saturday thirty five AAE members gathered in the Fellows Library at the Science Museum to attend the ninth annual meeting.

The day started with the Annual General Meeting, the minutes of which are enclosed elsewhere in this newsletter. This was the last AGM to be chaired by retiring president, Donald Gold. In his place as President for the ensuing session we elected Terence Murtagh. Terence is well known for his dynamic leadership at Armagh observatory and as a populariser of things astronomical.

There were few other changes to Council membership. The AAE Council for the session 1989/90 is:

President:	Terence Murtagh
Vice Presidents:	Donald Gold Undine Concannon David Hughes
Treasurer:	Nicholas Steggall
Secretary:	Bob Kibble
Assistant Secretaries:	Teresa Grafton Anne Cohen
Resource centre reps:	Tony Oldfield Harry Ford Martin Suggett
Members:	David Mannion Robert Mills Eva Hans
Editor:	Eric Zucker*
Co-Opted:	Julian Ravest*

\*Confirmed, in accordance with the constitution, at a Council meeting.

Lunch was taken at a number of local establishments, the most popular being the restaurant in the Victoria and Albert Museum.

The afternoon session provided us with two memorable presentations. First to address the meeting was HM Mr T. Lacey. Mr Lacey outlined the events which led to the final draft of Attainment Target 16 in the National Curriculum for Science. He noted and appreciated the importance of the AAE involvement at all stages during the discussions resulting in the final curriculum document.

Mr Lacey identified the task ahead as one of ensuring that the implementation of this section of the science curriculum was of a high quality. This would mean the production of good support materials for teachers and sensitive but widespread teacher inservice support. He suggested that this task alone should be the principal focus of AAE activities in the coming year.

Following a break for refreshments we were treated to a talk from our patron, Sir Francis Graham Smith, the Astronomer Royal. Sir Francis presented an informative and authoritative excursion through the world of Pulsar physics. He covered the historical developments leading up to and following the discovery of Pulsars and presented some of the areas of current research. Throughout the lecture the audience was treated to a confident display of astrophysics communicated at a tangible level by an expert. I am sure that the spinning egg trick works the same magic every time it appears.

I look forward to seeing even more members at the tenth annual meeting next year.

Bob Kibble, Secretary

## Astronomical Calculations on Pocket Computers

by Ted Wood

Now that pocket scientific calculators with some facilities for programming are available at reasonable prices, pupils might be encouraged to try them, out on astronomical calculations. Programs have been published, but they are usually intended for home computers of the larger type, giving results on a TV screen. Such programs, usually in the BASIC language, will generally be too complicated for pocket computers with limited storage capacity. The cheaper computers, under £30, can store programs from about 38 "steps" upwards, perhaps to about 150 "steps".

The question arises as to what astronomical calculations can be done on these computers. The answer may surprise those who have often fought shy of such calculations on the assumption that the mathematics involved is complicated. Although spherical trigonometry is employed, anyone with a smattering of knowledge of plane trigonometry can use the formulæ concerned. A little "low cunning" may be needed to fit your problem into the limited space, but even that can be a useful exercise. You will be delighted when you have produced a program which works!

The instruction book methods for programs on the smaller pocket computers are generally limited to formulæ like those for finding areas of circles and volumes of spheres. The more complicated "casino formula" for the spherical triangle

$$\cos c = \cos a \cos b + \sin a \sin b \cos C$$

and adaptations of this to provide the other angles A and B, can, however, be fitted into a computer with only 38 "steps". Some ingenuity is needed to design such programs. Often it helps to put values into memories in advance of preparing and running programs. You will also find the "return to beginning" facility can save program space (in non-BASIC instruments). Make a point of checking *all* your work on problems for which correct answers are available. We are all human and must not assume that our work is accurate – at least on the first attempts!

Always make a record of your programs and memory contents. There is often no way of finding out what programs are already in the computer!

☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆

Further details of the programme can be obtained from Mr. Wood or via the Editor.

## Derwentside Astronomical Society

When Derwentside Astronomical Society was formed in 1984 our intention was to promote and encourage astronomy in the Derwentside area. We have visited local schools as part of our 'Astronomy Roadshow' and held many public astronomy events. Our main aim from the very beginning was to create a Public Astronomy Centre in Derwentside. Now, in our fifth year, we are on the verge of realising this dream.

In the summer of 1988 we launched the Derwentside Observatory Project. The first task was to find a site . . .

Derwentside is situated in the North-West of County Durham. Heavy industry has declined in recent years. In particular, the giant steelworks of Consett is now only a memory, for the astronomer this has proved to be a blessing, with the skyglow and pollution having disappeared, the effect on the local economy however was equally drastic.

Many of our members are unemployed and we have concentrated on constructing portable instruments that are available on loan to people who are unable to buy their own equipment.

The Observatory was conceived as being a rather modest affair with minimal facilities and it was with this proposal that we approached our local council. They immediately suggested we contact the 'Sustrans' Company.

### The 'Sustrans' Connection

The Sustrans (SUSTainable TRANSport Company) is creating cycleways from disused railway tracks with interesting artworks en route. They quickly embraced the idea of the observatory and offered us a suburb site near Brooms Church, some 4km east of Consett. The site provides an excellent view to the south and minimal light pollution.

In addition, 'Sustrans' are providing building blocks for the fabric of the building.

Our original, rather functional, design, was a little too basic for Sustrans so the services of top North East architect Mr David Darbyshire were engaged.

The resulting design is both striking and functional. Two permanent telescopes will be sited in the main 12ft. dome, a 25cm. Newtonian/Cassegrain telescope with computer control in the modified run-off roof section, a 15cm. Newtonian between the two and a visitor centre for school groups etc.. Darkroom facilities will be provided along with a library and meeting room.

Sustrans are also planning a scale model of the solar system with the sun being represented by a 15 metre circle near the observatory and the planets at their correct scale distance and size being depicted along the cycleway. An official opening of the project should take place before the end of the year. Dr. Patrick Moore has agreed to 'Do the Honours'.

Jim Laidlaw  
Derwent Astronomical Society  
(Article received via Eva Hans).

## SCHOOL ESSAY COMPETITION

The Education Committee of the Royal Astronomical Society is promoting an essay competition for the age range 14-18 years. This is timed to relate to National Astronomy Week (17-24 November, 1990) and to coincide with the completion of the move of the Royal Greenwich Observatory to Cambridge. The announcement of the winner will be made during National Astronomy Week.

The judges would consist of a panel including Dr. Michael Penston of the RGO and Heather Couper. A fairly general subject, such as "Astronomy Today", "Man's Place in the Universe" or "The Origins of the Earth" would be considered suitable.

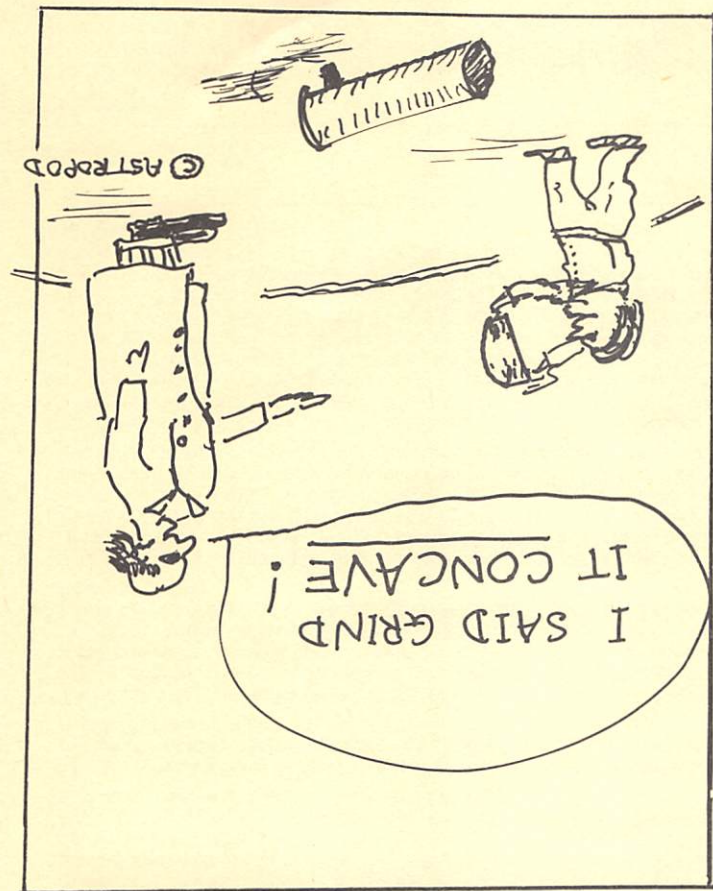
The first prize will be a holiday for three in Tenerife (due to the sponsorship of American Express Travel Services), plus travel and accommodation on La Palma and a night-time visit to the telescopes there (thanks to sponsorship by the Royal Greenwich Observatory).

There will be a number of consolation prizes.

The RAS is anxious to obtain the widest circulation of these details.

REMINDER – NATIONAL ASTRONOMY WEEK  
17-24 NOVEMBER 1990  
More details in next issue





N. E. Stegall

President Bush chose the name *Endeavour* for the new Space Shuttle orbiter, currently under construction. (Note the British spelling). The name *Endeavour* resulted from a US nationwide orbiter-naming competition supported by educational projects created by student teams in elementary and secondary schools.

In the competition, involving over 71,000 students, the national winner in Division I (kindergarten through grade 6) was the fifth grader from Talulah Falls School, Georgia. This nine member team was composed of maths students in grades 8-12. The team project was two-fold. They developed a maths magazine, "Math Exploration with James Cook," written on 3 education levels, and they created a play, "Where on Earth? ...," comparing Cook's 18th century sea exploration to the Space Shuttle *Endeavour's* 20th century space exploration.

These two winning teams were selected from over 6,100 entries. The judging criteria was: 80 percent for the quality and creativity of the educational project to support and justify the name; 20 percent for the name's pronounceability for transmission and the ability to capture the spirit of the American pioneer spirit. The name had to be that of a seafaring vessel used in research or exploration. Both winning teams proposed the name *Endeavour*.

*Endeavour* was the first ship commanded by James Cook, a British explorer, navigator and astronomer. In August 1768, on *Endeavour's* maiden voyage, Cook observed and recorded the transit of the planet Venus. In the view of the students, Cook's navigations, explorations and discoveries eventually led man to the possibilities of space exploration.

"In selecting the name *Endeavour*, the students and the President have identified a name that symbolizes perfectly NASA's goals of space exploration and discovery," said Dale D. Myers, NASA's Acting Administrator. "The nation can rest assured that we will use this ship with the same commitment that Captain Cook used his in the pursuit of new knowledge to benefit all mankind.

The new orbiter, previously designated OV-105, is being built by Rockwell International to replace the Space Shuttle orbiter lost in the Challenger accident in 1986. *Endeavour* is scheduled to be completed in 1991 with her maiden voyage scheduled for March 1992.

## Space Shuttle Orbiter Endeavour

## BOOK REVIEWS

WALKER (1989), Adam Hilger, IOP Publishing Ltd., pp 293, hardback, £14.95, ISBN 0-85274-830-2).

This excellent book is aimed at those who are contemplating becoming amateur astronomers (including "armchair" astronomers who make use of home computers, now so widely available). But it will also prove absorbing reading for those who already are amateur astronomers. The authors (Alan Cooper of the Open University and Norman Walker, formerly of the Royal Greenwich Observatory) stress the point, which is currently being widely propagated, that whereas most of the very specialized work is done by professional astronomers, and which is extremely expensive, there is still a very important role to be played by the amateur. (Few amateurs would be able to launch their own space telescope).

The book, as indicated by its title, deals in the main with the stars: it is not a general survey of astronomical knowledge. There is one chapter on the minor planets and comets, however, as this deals with the astrophysical significance of these bodies.

From the very beginning the authors emphasize the importance of physics and the first chapter gives a clear resume of relevant parts of this subject and its relationship with astrophysics. It is intriguing to see protons and the observed universe plotted on the same graph.

The chapter entitled "Looking at the Stars" deals with the relationships between their temperature and brightness (luminosity); and temperature, mass and radius). Then follows a chapter dealing with possible structures of stars, including a section on the equilibrium balance between internally generated energy and gravitational collapse.

That stars are not static entities is dealt with in a chapter on stellar evolution, which leads into a chapter devoted to radiation.

The reader's appetite should by now be well whetted, and he should be ready to plunge into a section on pulsating stars, followed by another on binaries. This leads naturally into one dealing with exploding stars (of all kinds).

The final part of the book deals with the practical work which is so basic to astronomy as a science. In particular, the authors concentrate on photometry (measurement of brightness) and give details of different kinds of photometer; this is where the amateur may come into his own. The authors say that these sections of the book may be skipped if the reader does not intend joining the ranks of practical observers, but I feel that to do this would constitute a great loss. A large number of projects are described which are within the capabilities of many amateurs. These include measurements on bright stars, stars in the "instability strip", and binary variables. There are nine appendices, a glossary and a good index. There is the minimum of mathematics for this purpose, and not far short of one there are so many other books for this purpose, and quite justified as diagram per page). I thoroughly recommend this book to all would be amateur astronomers and others who enjoy a good read.

### BOOK REVIEWERS WANTED

Eric Zucker

Would you like to review books for *Gnomon*? From time to time we receive astronomy books for review from various publishers. If you review a book, you may keep it, with the publishers' compliments. Please contact the Editor if you would like to join a panel of reviewers.

## LE CIEL ET L'ESPACE

European Meetings on Astronomy and Space at Montpellier, France, from 20-23 September, 1989

The meetings have been organised by the Observatory of the French Association of Astronomy at Ariane (Heraul), under the auspices of the European Community Commission. The European Space Agency and the European Southern Observatory will participate. The meetings will be under the high patronage of the Minister of Research and Technology of the French Republic.

Among the items on the programme are: Space for Everyone (the consequences of space research for the European citizen) - on 22 September; and Astronomy and Practice (the information tools for the European public in the fields of Astronomy and Space) - on 23 September.

The general public will be particularly interested in the following topics:

(1) The sky and space through the publicity media (20 September, evening).

(2) Study of the Solar System: an assessment. After Voyager Phobos ... with Cassini, Galileo ... Current views and forecasts on the solar system (21 September, evening).

(3) Apollo ... 20 years ago already! Hermes ... in ten years time. Some American, Soviet and European space travellers take us through the space epic (22 September, evening).

It is necessary to register for these meetings and application for registration forms should be made as soon as possible to L'Observatoire Astronomique, 34150 Ariane (Heraul), France.



## ASTRONOMY IN CANADA

The Editor recently visited Western Canada and was fortunate in being able to have a tour of the Dominion Astrophysical Observatory (DAO) just outside Victoria on Vancouver Island, thanks to the kindness of Dr. Chris Aikman who gave up a Sunday afternoon in his garden in order to conduct the tour at almost zero notice!

The Observatory is run by the Herzberg Institute of Astrophysics, National Research Council of Canada. Readers of *Gnomon* will see in the supplement to the last (April) issue (the "Universe in the Classroom" published by the Astronomical Society of the Pacific) that Dr. Aikman is the contact for the Canadian Astronomical Society, which is concerned in improving the teaching of Astronomy; it is one of the four bodies which sponsor the "Universe in the Classroom".

The following extracts are taken from DAO publications:

"The Dominion Astrophysical Observatory of the National Research Council opened in 1918 with the world's largest and most modern telescope.

The observatory's founder, John Stanley Plaskett, recorded his first stellar spectrum on the 1.85 metre telescope on May 6, 1918. (Plaskett was later immortalized through his discovery of what is still the most massive star system known. The binary star with a total mass 140 times greater than the sun is named Plaskett's Star.)

The location on Little Saanich Mountain outside the British Columbia capital of Victoria was carefully chosen. A key factor is the "seeing" or clarity of the image reaching the telescope mirror.

Today the original telescope is maintained as a competitive research instrument, drawing visiting observers from Canadian and US universities and as far away as Europe, China and Japan. Sophisticated optical improvements and new electronic detectors now enable the telescope to operate about 10,000 times more efficiently than when it was built, opening up new realms of study to observers.

The observatory's original work - major studies in stellar and galactic astronomy, which established Canadian astronomers at DAO as world leaders - continues today with extensive studies of binary and multiple stars. The topic has been broadened to include the mysterious X-ray sources first discovered with rocket instruments. While studying one such X-ray source in 1984, astronomers from DAO working with international colleagues, discovered what is considered to be the best candidate for a stellar black hole.

Plaskett and other DAO colleagues studied the motions of young luminous stars in the Milky Way for two decades and were able to provide the first accurate description of the size and nature of the Milky Way Galaxy in which our solar system is located. Work by another astronomer at DAO helped to consolidate the Big Bang theory to explain the Universe. DAO staff has recently determined the most reliable estimates for the age of our Milky Way Galaxy (12 to 14 billion years). In 1987, another DAO astronomer deduced the presence of a supermassive black hole, 10 million times as massive as the sun, at the center of our neighboring galaxy, the Andromeda Nebula.

In addition of the 1.2 metre telescope in 1962 provided Canadian and visiting astronomers with a second instrument specialized for precision spectrographic work. Like the 1.85 metre telescope, it is used every clear night of the year and has played a key role in the development of advanced instrumentation in Canadian astronomy.

The 1988 extension to the observatory houses computing equipment and the recently inaugurated Canadian Astronomy Data Centre; the electronics and instrumentation laboratory, the photo lab and the library.

The Canadian Astronomy Data Centre will receive data from the Canada-France-Hawaii Telescope as well as from several space telescopes, the most important of which is the Hubble Space Telescope to be launched by NASA. Space telescopes operating high above the earth's atmosphere record images of unprecedented clarity and at colors inaccessible from the ground.

The Data Centre combined with the existing library which contains the most complete collection of astronomical material in Canada, places DAO at the heart of Canadian astronomical research. Through it, scientists from across Canada will have access to observations from the most modern astronomical equipment in the world, allowing them to continue Canada's reputation for excellence in astrophysical research."

Contact was also made with the Planetarium and Observatory at Vancouver, but it was not possible to visit these owing to constructional work in progress to remove blue asbestos. The Planetarium is the meeting place of the Royal Astronomical Society of Canada. The Space Sciences Society, which is run by the Planetarium, publishes a number of booklets, including a monthly calendar, and an extremely well produced newsletter, called the *Starry Messenger*. These publications would be of particular interest to members of the AAE and any member who would like a sight of some of them should contact the Editor (a small charge to cover the cost of photocopying will be made).

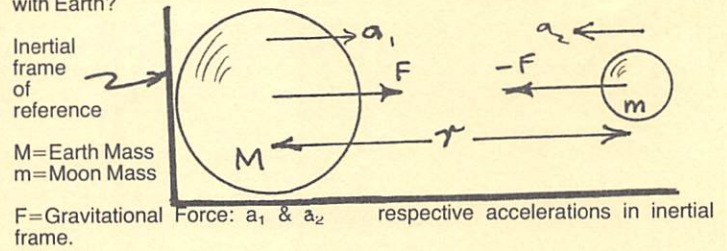
## Copyright

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## SOLUTION TO GNOBLEM 6

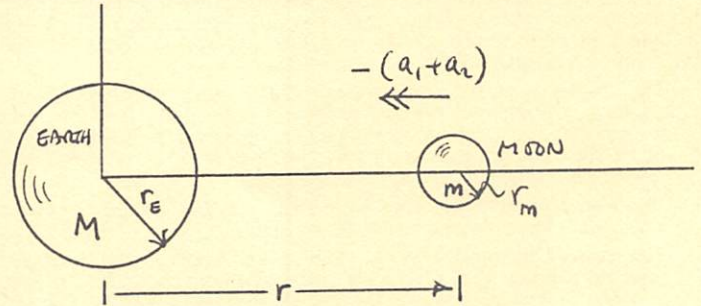
Two replies on this problem of the Moon falling into the Earth, are summarised below. One, from Keith Atkin is given below. The other, which contains interesting comments, is in the *LETTERS* section.

If Moon's revolution were suddenly to stop, how long would it take to collide with Earth?



$$|a_1| = F/M : |a_2| = F/m \quad (1)$$

Switching to the Earth's frame of reference, we need to add  $-a_1$  that is



$$\begin{aligned} \frac{d^2r}{dt^2} &= -(a_1 + a_2) \\ &= -(F/M + F/m) \quad (\text{using equations (1)}) \\ &= -\frac{GMm}{r^2} \quad (\text{using Newton's Law of Gravitation}) \end{aligned}$$

so,

$$\frac{d^2r}{dt^2} = -\frac{G}{r^2} (m+M) \quad \text{equation of motion of Moon (2)}$$

Combining equations (1) and (2) making some transformations and using standard integrals eventually gives the times for impact:

Substitution of data:

$$\begin{aligned} M &= 5.9 \times 10^{24} \text{ kg} \\ m &= 7.4 \times 10^{22} \text{ kg} \\ G &= 6.7 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2} \\ r_o &= 3.8 \times 10^8 \text{ m (Lunar Orbital Radius)} \\ r_m &= 1738 \text{ km (Lunar Radius)} \\ r_e &= 6400 \text{ km (Earth Radius)} \end{aligned}$$

Gives a value of:

Time to Impact,  $T = 4.75$  days

(full analysis will be provided on request)

## FUTURE PLANS FOR THE LONDON PLANETARIUM

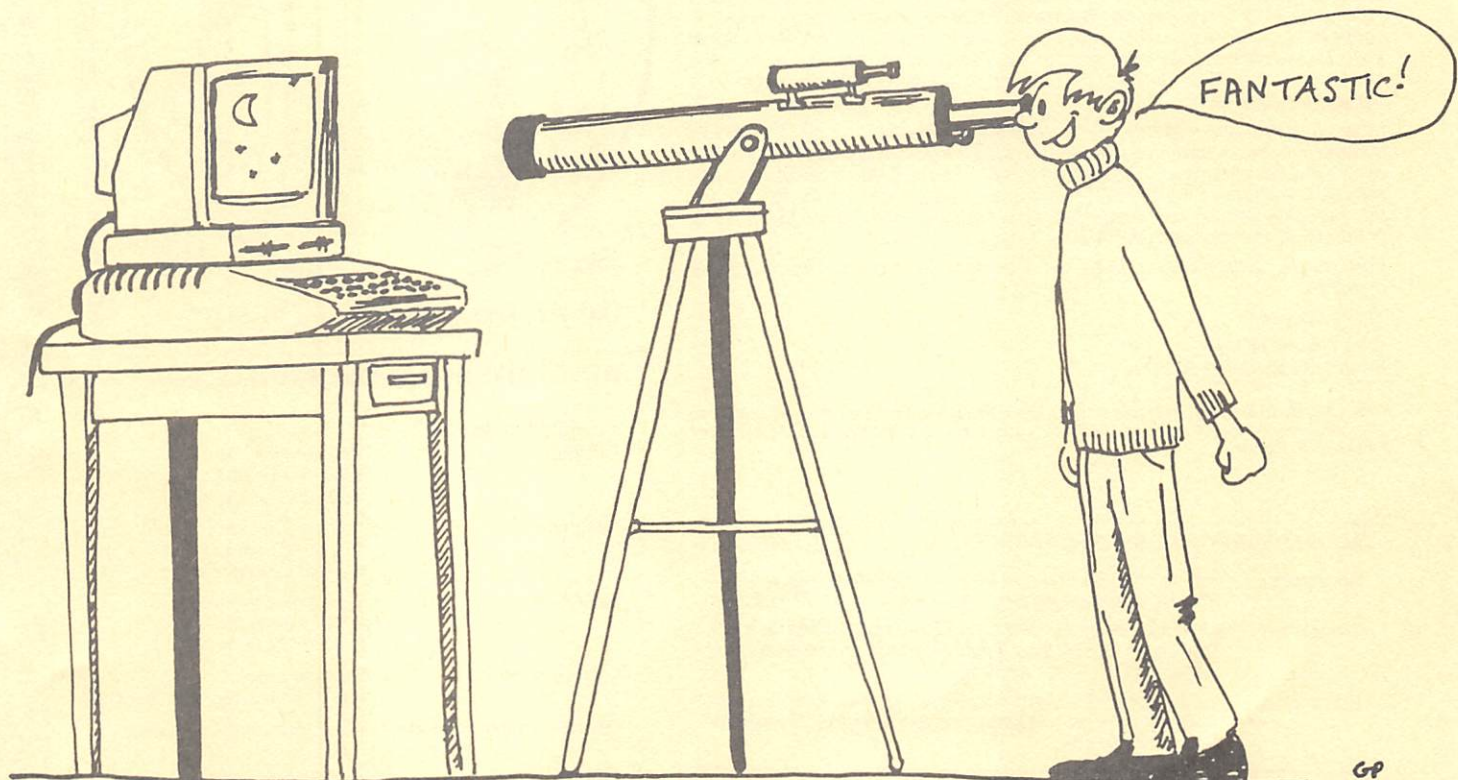
Madame Tussaud's, parent company of the London Planetarium, is taking a long-term view of its Marylebone Road site. A variety of discussions on the subject of a new Planetarium director have been held - John Ebdon having retired at the end of last year, after 20 years in charge of the most visited planetarium in the world. Future developments in the building as a whole have a bearing on the timing of any new appointment, and it is for this reason that no immediate decision is to be made. Undine Concannon will continue as Administrator.

Enquiries should be made to Undine Concannon or Juliet Simpkins at the London Planetarium, Marylebone Road, London, NW1 5LR (telephone 01-486-1121).





SCHOOLCHILDREN AT JODRELL BANK (see p.1)



Le Comité de Liaison Enseignants et Astronomes ("Les Cahiers Clairaut", France).



## LETTERS

Dear Editor,

In answer to the "Editorial Comment" in *Gnomon* vol. 8 no. 3—

The daily "Dundee Courier and Advertiser" carries a daily horoscope, and has done as long as I can remember. Since the winter of 1985/6 (the winter of Halley's Comet), it has also carried a monthly astronomical item — about 250 words on what can be seen in the night sky during the coming month, contributed by myself. The feedback I get from this suggests that quite a lot of people read it and find it interesting; I don't know how many of the same people also read their horoscope!

The weekly "St Andrews Citizen" carries neither astronomical nor astrological information. I have the impression that this paper will print anything of interest it is given, but presumably no local astronomer is prepared to contribute a regular feature, and presumably astrologers charge for their predictions.

The only other "local" paper I regularly see is the "Shetland Times", which likewise ignores both astronomy and astrology.

Incidentally, I believe the local radio station in this area, the independent Radio Tay, also broadcasts a daily horoscope — it certainly has done so in the recent past. However, it also broadcasts short talks on astronomy no less than four times a week. This may be because I am willing to write and record the talks for free!

Yours sincerely,  
Dr. Fiona Vincent  
Mills Observatory, Dundee

Dear Editor,

In response to your request in *Gnomon* for astronomical blunders in the press, how about this one from the Secretary of State for Education and Science, of all people!

The quote is from the Sunday Times on 2 April 1989. In an article called "Technical Knockout", Mr. Baker is quoted as saying of the CTCs:

"I never meant them to be like comets — shooting across the horizon and then disappearing".

He has obviously never seen a comet!

Yours sincerely,  
Dr. Anne Cohen,  
Bollington,  
Macclesfield.

Following the article in the last issue on the Ballarat Astronomical Society in Australia, and some ensuing correspondence, Karenga Burk comments on the article on the tunnel through the Earth, passing through its centre. An object dropped down such a tunnel would end up in the antipodes 42 minutes later (see the Newsletter of the AAE, Vol. 6 No. 2, January 1987). It was suggested that this might provide a quick way of corresponding with our antipodean colleagues, but Mrs. Burk points out that, contrary to common belief, mainland Australia is not at the antipodes. The relevant parts of her letter are given below:

Dear Editor,

If you actually drove a hole through the centre of the Earth from England, hoping to come out in Australia, you might have a bit of a shock! According to the longitude and latitude coordinates on the opposite side of the Earth (180° and 51°30'), you would emerge in the South Pacific Ocean, about 1° south-east of the Antipodes Islands, just south of where the International Date Line, having been bent around the Fiji group of islands, rejoins the 180° line of longitude. In fact, you would be perched near the edge of a high underwater cliff!

I was very interested in the ASP's publication about astrology. The rise of interest in pseudo-sciences is quite worrying, I think. At our local community centre in Creswick (population about 2,500), I have given talks in the past, called "Astronomy for L-platers". Last term, not one person signed up, yet the astrology course was supported! I will certainly try to obtain at least one of the books mentioned in the ASP's "Resource Corner".

Fortunately, astronomy is also on the rise, in schools, from primary onwards.

Yours sincerely,  
(Mrs.) Karenza Burk,  
Editor, *Oddie-Baker Bulletin*.

[The AAE would be very interested to learn more about astronomy teaching in schools in Australia, referred to in Mrs. Burk's letter. Is it a compulsory part of the school curriculum, for example? Editor]

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Dear Editor,

The "falling Moon" problem, GNOBLEM 6, was a hardy annual in the days when some elementary dynamics featured illustratively in undergraduate courses on the infinitesimal calculus. The only information given was the Moon's orbital period. Using Newton's law of gravitation, written as a first order and degree differential equation, and Kepler's third law, in its modern form, together with the obvious boundary conditions, all the quantities except the lunar period 'cancelled out' leaving:-

$$\begin{aligned} \text{Time of fall} &= \text{Moon's period} \times \text{pure number.} \\ &= 4 \text{ days } 20 \text{ hours approximately} \end{aligned}$$

I am amused to find that I can still reproduce this minor academic exercise in all its examination room glory! But irritated that, despite several intensive attacks on the problem, I cannot find a more down to earth solution. (The pun was unintended).

I pray that one of our more percipient members will enlighten me.

All good wishes.

Yours sincerely,  
Lt. Cdr. L. M. Dougherty,  
Barkisland, West Yorkshire.

### Archæopteryx

Of passing interest to readers, an article in the very same *Radio Times* referred to in the Astrology article, comments on the controversy over whether or not the fossils of the archæopteryx were fakes. The producer of the programme which dealt with this ("Lost Worlds, Vanished Lives") explains that it was not palæontologists who doubted the authenticity of the fossils, but the astronomer, Sir Fred Hoyle.

David Attenborough exhibited one of these fossils in the programme.

### Second-hand review

This is a review of a review, included because of its interest to astronomers. The *Daily Telegraph* (6.5.89), under the heading "Small Print" says:

From a book review in the astronomical journal *The Observatory*: "An important aspect of the book is that numerical errors are hard to find, which makes it much more useful".

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"The Starry Messenger", Jan. 1988

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